

What is claimed is:

1. A prefabricated asphalt-based waterproof roofing membrane; the prefabricated asphalt-based waterproof roofing membrane having a length and a width; the prefabricated asphalt-based waterproof roofing membrane having an top major surface and a bottom major surface defined by the length and the width of prefabricated asphalt-based waterproof roofing membrane; the top major surface of the prefabricated asphalt-based waterproof roofing membrane having an exposed portion that is exposed when the prefabricated asphalt-based waterproof roofing membrane is installed on a roof and a lateral edge portion, extending for the length of the prefabricated asphalt-based waterproof roofing membrane, that is overlapped by an adjacent prefabricated asphalt-based waterproof roofing membrane when the prefabricated asphalt-based waterproof roofing membrane is installed on a roof, the prefabricated asphalt-based waterproof roofing membrane comprising:

an asphalt saturated reinforcing substrate having a length and a width; the asphalt saturated reinforcing substrate having a top major surface and a bottom major surface defined by the length and the width of the asphalt saturated reinforcing substrate; a top asphalt layer overlaying and coextensive with the top major surface of the asphalt saturated reinforcing substrate and a bottom asphalt layer overlaying and coextensive with the bottom major surface of the asphalt saturated reinforcing substrate; the top and bottom asphalt layers, with the asphalt saturated reinforcing substrate, forming an asphalt saturated and coated reinforcing substrate;

a highly reflective thermoplastic elastomeric sheet layer bonded to a top surface of the top asphalt layer; the highly reflective thermoplastic elastomeric sheet layer having a top surface forming a top surface of the exposed portion of the top major surface of the prefabricated asphalt-based waterproof roofing membrane; the top surface of the highly reflective thermoplastic elastomeric sheet layer having an initial solar reflectance of at least 0.65 and a solar reflectance of at least 0.50 after three years.

2. The prefabricated asphalt-based waterproof roofing membrane according to claim 1, wherein:

the prefabricated asphalt-based waterproof roofing membrane includes a polymer primer layer intermediate the top asphalt layer and the highly reflective thermoplastic elastomeric sheet layer that is impermeable to oils and other colored components of the top asphalt layer to keep the oils and other colored components of the top asphalt layer from exuding into the highly reflective thermoplastic elastomeric sheet layer and reducing the reflectance of the highly reflective thermoplastic elastomeric sheet layer; and

the polymer primer layer is bonded the top surface of the top asphalt layer; and the highly reflective thermoplastic elastomeric sheet layer is bonded to the top surface of the top asphalt layer by being bonded to a top surface of the polymer primer layer.

3. The prefabricated asphalt-based waterproof roofing membrane according to claim 2, wherein:

the highly reflective thermoplastic elastomeric sheet layer comprises a polyvinyl chloride or a thermoplastic olefin and a reflective pigment.

4. The prefabricated asphalt-based waterproof roofing membrane according to claim 3, wherein:

the highly reflective thermoplastic elastomeric sheet layer is reinforced.

5. The prefabricated asphalt-based waterproof roofing membrane according to claim 2, wherein:

at least one of the top major surface and the bottom major surface of the prefabricated asphalt-based waterproof roofing membrane has a release layer thereon that is removed prior to installation of the prefabricated asphalt-based waterproof roofing membrane and that permits the prefabricated asphalt-based waterproof roofing membrane to be wound into a roll for packaging, storage, shipping, and handling and unwound from the roll for installation; and

the prefabricated asphalt-based waterproof roofing membrane is wound into a roll.

6. The prefabricated asphalt-based waterproof roofing membrane according to claim 1, wherein:

the highly reflective thermoplastic elastomeric sheet layer overlies substantially the entire top major surface of the prefabricated asphalt-based roofing membrane.

7. The prefabricated asphalt-based waterproof roofing membrane according to claim 1, wherein:

the highly reflective thermoplastic elastomeric sheet layer only overlies the exposed portion of the top major surface of the prefabricated asphalt-based roofing membrane.

8. The prefabricated asphalt-based waterproof roofing membrane according to claim 1, wherein:

the highly reflective thermoplastic elastomeric sheet layer is bonded directly to the top surface of the top asphalt layer.

9. The prefabricated asphalt-based waterproof roofing membrane according to claim 8, wherein:

the highly reflective thermoplastic elastomeric sheet layer comprises a polyvinyl chloride or a thermoplastic olefin and a reflective pigment.

10. The prefabricated asphalt-based waterproof roofing membrane according to claim 9, wherein:

the highly reflective thermoplastic elastomeric sheet layer is reinforced.

11. The prefabricated asphalt-based waterproof roofing membrane according to claim 8, wherein:

at least one of the top major surface and the bottom major surface of the prefabricated asphalt-based waterproof roofing membrane has a release layer thereon that is removed prior to installation of the prefabricated asphalt-based waterproof roofing membrane and that permits the prefabricated asphalt-based waterproof roofing membrane to be wound into a roll for packaging, storage, shipping, and handling and unwound from the roll for installation; and

the prefabricated asphalt-based waterproof roofing membrane is wound into a roll.

12. The prefabricated asphalt-based waterproof roofing membrane according to claim 8, wherein:

the highly reflective thermoplastic elastomeric sheet layer overlies substantially the entire top major surface of the prefabricated asphalt-based roofing membrane.

13. The prefabricated asphalt-based waterproof roofing membrane according to claim 8, wherein:

the highly reflective thermoplastic elastomeric sheet layer only overlies the exposed portion of the top major surface of the prefabricated asphalt-based roofing membrane.

14. A method of making a prefabricated asphalt-based waterproof roofing membrane; the prefabricated asphalt-based waterproof roofing membrane having a length and a width; the prefabricated asphalt-based waterproof roofing membrane having an top major surface and a bottom major surface defined by the length and the width of prefabricated asphalt-based waterproof roofing membrane; the top major

surface of the prefabricated asphalt-based waterproof roofing membrane having an exposed portion that is exposed to the weather when the prefabricated asphalt-based waterproof roofing membrane is installed on a roof and a lateral edge portion, extending for the length of the prefabricated asphalt-based waterproof roofing membrane, that is overlapped by an adjacent prefabricated asphalt-based waterproof roofing membrane when the prefabricated asphalt-based waterproof roofing membrane is installed on a roof, the method comprising:

- providing a reinforcing substrate having a length and a width; the reinforcing substrate having a top major surface and a bottom major surface defined by the length and the width of the reinforcing substrate;

- saturating the reinforcing substrate with asphalt;

- forming a top asphalt layer overlaying and coextensive with the top major surface of the reinforcing substrate and a bottom asphalt layer overlaying and coextensive with the bottom major surface of the reinforcing substrate so that the top and bottom asphalt layers, with the asphalt saturated reinforcing substrate, form an asphalt saturated and coated reinforcing substrate;

- applying and bonding a highly reflective thermoplastic elastomeric sheet layer to a first portion of a top surface of the top asphalt layer of the saturated and coated reinforcing substrate; the highly reflective thermoplastic elastomeric sheet layer forming the portion of the top major surface of the prefabricated asphalt-based waterproof roofing membrane that is exposed to the weather when the prefabricated asphalt-based waterproof roofing membrane is installed on a roof; the highly reflective thermoplastic elastomeric sheet layer having a top surface that has an initial solar reflectance of at least 0.65 and a solar reflectance of at least 0.50 after three years;

- applying a release means to at least one of the major surfaces of the prefabricated asphalt-based waterproof roofing membrane so that the prefabricated asphalt-based waterproof roofing membrane can be wound into a roll for packaging, storage, shipping, and handling and unwound from the roll for installation; and

- winding the prefabricated asphalt-based waterproof roofing membrane into a roll.

15. The method of making a prefabricated asphalt-based waterproof roofing membrane according to claim 14, including:

- applying a polymer primer layer, which is impermeable to oils and other colored components of the top asphalt layer, to the top asphalt layer so that: the polymer primer layer is interposed between the top asphalt layer and the highly reflective thermoplastic elastomeric sheet layer to keep the oils and other colored components of the top asphalt layer from exuding into the highly reflective thermoplastic elastomeric sheet layer and reducing the reflectance of the highly reflective thermoplastic elastomeric sheet layer; the polymer primer layer being bonded the top surface of the top asphalt layer; and the

highly reflective thermoplastic elastomeric sheet layer being bonded to the top surface of the top asphalt layer by being bonded to a top surface of the polymer primer layer.

16. The method of making a prefabricated asphalt-based waterproof roofing membrane according to claim 15, wherein:

the highly reflective thermoplastic elastomeric sheet layer comprises a polyvinyl chloride or a thermoplastic olefin and a reflective pigment.

17. The method of making a prefabricated asphalt-based waterproof roofing membrane according to claim 15, wherein:

the highly reflective thermoplastic elastomeric sheet is a preformed sheet.

18. The method of making a prefabricated asphalt-based waterproof roofing membrane according to claim 14, wherein:

the highly reflective thermoplastic elastomeric sheet layer is applied to substantially the entire top surface of the top asphalt layer of the saturated and coated reinforcing substrate so that the highly reflective thermoplastic elastomeric sheet layer forms substantially the entire top major surface of the prefabricated asphalt-based waterproof roofing membrane.

19. The method of making a prefabricated asphalt-based waterproof roofing membrane according to claim 14, wherein:

the highly reflective thermoplastic elastomeric sheet layer is applied only to the first portion of the top surface of the top asphalt layer of the saturated and coated reinforcing substrate so that the highly reflective thermoplastic elastomeric sheet layer only forms the exposed portion of the top major surface of the prefabricated asphalt-based waterproof roofing membrane and a second portion of the top surface of the top asphalt layer forms the lateral edge portion of the prefabricated asphalt based waterproof roofing membrane that extends for the length of the prefabricated asphalt-based waterproof roofing membrane and is overlapped by an adjacent prefabricated asphalt-based waterproof roofing membrane when the prefabricated asphalt-based waterproof roofing membrane is installed on a roof.

20. The method of making a prefabricated asphalt-based waterproof roofing membrane according to claim 14, wherein:

the highly reflective thermoplastic elastomeric sheet layer is bonded directly to the top surface of the top asphalt layer.

21. The method of making a prefabricated asphalt-based waterproof roofing membrane according to claim 20, wherein:

the highly reflective thermoplastic elastomeric sheet layer comprises a polyvinyl chloride or a thermoplastic olefin and a reflective pigment.

22. The method of making a prefabricated asphalt-based waterproof roofing membrane according to claim 20, wherein:

the highly reflective thermoplastic elastomeric sheet is a preformed sheet.

22. The method of making a prefabricated asphalt-based waterproof roofing membrane according to claim 21, wherein:

the polymer binder material is selected from a group consisting essentially of: acrylic-based elastomers and isocyanate-based elastomers.

23. The method of making a prefabricated asphalt-based waterproof roofing membrane according to claim 20, wherein:

the highly reflective thermoplastic elastomeric sheet layer is applied to substantially the entire top surface of the top asphalt layer of the saturated and coated reinforcing substrate so that the highly reflective thermoplastic elastomeric sheet layer forms substantially the entire top major surface of the prefabricated asphalt-based waterproof roofing membrane.

24. The method of making a prefabricated asphalt-based waterproof roofing membrane according to claim 20, wherein:

the highly reflective thermoplastic elastomeric sheet layer is applied only to the first portion of the top surface of the top asphalt layer of the saturated and coated reinforcing substrate so that the highly reflective thermoplastic elastomeric sheet layer only forms the exposed portion of the top major surface of the prefabricated asphalt-based waterproof roofing membrane and a second portion of the top surface of the top asphalt layer forms the lateral edge portion of the prefabricated asphalt based waterproof roofing membrane that extends for the length of the prefabricated asphalt-based waterproof roofing membrane and is overlapped by an adjacent prefabricated asphalt-based waterproof roofing membrane when the prefabricated asphalt-based waterproof roofing membrane is installed on a roof.